2005 Annual Consumer Confidence Report on Tap Water Quality

Edwards Air Force Base
Air Force Research Laboratory (AFRL)

English: **This report contains very important information on drinking water. Translate it or speak with someone who understands it well.**

Spanish: **Este reportaje contiene información muy importante sobre agua potable. Tradúzcalo ó hable con alguien que lo entienda bien.**

INTRODUCTION

This is an annual report on the quality of water delivered by Edwards Air Force Base (EAFB). Under the "Consumer Confidence Reporting Rule" of the Federal Safe Drinking Water Act, community water systems are required to report this water quality information to the consuming public. Presented in this report is information on the source of our water, its constituents and the health risks associated with any contaminants. We continually monitor the drinking water for contaminants. We are pleased to report our water is safe to drink.

WHERE OUR WATER COMES FROM

The Edwards Air Force Base Air Force Research Laboratory (AFRL) Drinking Water System gets water from two sources:

1. On-base ground water wells.
2. Surface water supplied by the Antelope Valley East Kern (AVEK) Water Agency.

We have 4 on base ground water wells that are chlorinated at a booster station. From there, the water is pumped to and blended with the AVEK water and sent through the distribution system. The water we receive from the AVEK Water Agency is supplied in finished drinking water quality form (this water line serves other AVEK customers such as the city of Boron). The AVEK Water Agency supply is primarily from the California Aqueduct, a surface water source. As a water wholesaler, the AVEK Water Agency published their 2005 Water Quality Report earlier this year. We have included information on their water quality as an integral part of this report.

DRINKING WATER BASICS

The sources of drinking water include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- *Microbial contaminants*, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife. One such possible contaminant is Cryptosporidium. Cryptosporidium is a one-celled parasite that can cause a gastrointestinal illness called cryptosporidiosis. It occurs in the feces of infected animals or humans. It is environmentally resistant and may survive outside the body for long periods of time. To become infected, a person must consume contaminated food or water, including from streams or rivers. The people most susceptible to cryptosporidium are those on chemotherapy, organ or bone marrow recipients, persons with HIV or AIDS, malnourished children, the very young and the very old.

- *Inorganic contaminants*, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

- *Pesticides and herbicides* that may come from a variety of sources such as agriculture, urban stormwater runoff, and septic systems.

- *Organic chemical contaminants,* including synthetic and volatile organic chemicals that are by products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff and septic systems.

- *Radioactive contaminants,* which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, United States Environmental Protection Agency (USEPA) and the state Department of Health Services prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

Additional General Information on Drinking Water

Drinking water, including bottled water may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people such as those with cancer undergoing chemotherapy, those who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791) or online at http://www.epa.gov/safewater/index.html.

WATER CONSERVATION TIPS

Turn water off when shaving and brushing your teeth.
Run only full loads in washing machine and dishwasher
Adjust lawn sprinklers to water the grass not the street.
Take shorter showers. Turn water off while lathering up.
Use the garbage can rather than the garbage disposal.

Water is a natural resource not to be wasted.

DEFINITIONS

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water.

Maximum Contaminant Level Goal MCLG: The level of a contaminant in drinking water below which there is no known or expected health risk.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs' are set by the California Environmental Protection Agency.

Primary Drinking Water Standards (PDWS): MCLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements (potability).

Secondary Drinking Water Standards (SDWS): MCLs for contaminants that may adversely affect the taste, odor or appearance of drinking water (palatability).

90th Percentile Level: The level of lead and copper at which 90% of drinking water samples taken in a system are below. This level is compared with the MCL for lead and copper to determine system compliance.

ACRONYMS AND TERMS

AL	Action Level; the concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow
ND	not detectable at testing limit
ppm	parts per million; a unit of measure equivalent to a single penny in $10,000, equivalent to milligrams per liter.
ppb	parts per billion; a unit of measure equivalent to a single penny in $10,000,000, equivalent to micrograms per liter.
Level Detected	laboratory analytical result for a contaminant; this value is evaluated against an MCL or AL to determine compliance
Range	the range of the highest and lowest analytical values of a reported contaminant. For example, the range of reported analytical detections for an unregulated contaminant may be 10.1 ppm (lowest value) to 13.4 ppm (highest value). EPA requires this range to be reported.

pCi/l picocuries per liter of water (a measure of radiation)

SOURCE WATER ASSESSMENT

The Civil Engineering Department at Edwards Air Force Base has produced the 2002 Source Water Assessment, completed 16 May 2002, and it is on file in the Civil Engineering office (661-277-5000). No possible contaminating activities for the wells surveyed were found. AVEK also provides a Source Water Assessment for the water they distribute. This is a new state requirement and lists the Physical Barrier Effectiveness, Inventory of Possible Contaminating Activities, Vulnerability Ranking, Assessment Map, Assessment Summary, and Public Notification procedures.

MONITORING OF YOUR DRINKING WATER

At Edwards Air Force Base, we monitor contaminant groups listed in column 1 of Table 1 using EPA-approved methods. Column 2 of Table 1 specifies the monitoring frequency.

Table 1
Contaminant Groups and Monitoring Frequency
AFRL

Analyte/Contaminant Group	Monitoring Frequency	Last Done
Lead and Copper	Every 3 Years	2005
Inorganic Chemicals	Annually	2005
Radioactivity	Every 3 Years	2003
Volatile Organic Chemicals	Annually	2005
Taste, Odor, Appearance Factors	Annually	2005

EDWARDS AFB 2004 WATER MONITORING RESULTS SUMMARY

Tables 2 – 4 list all of the primary drinking water standard contaminants that were detected during the most recent sampling for the constituent. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. The Department requires us to monitor certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, are more than one year old.

Table 5 lists all of the secondary drinking water standard contaminants that were detected during the most recent sampling for the constituent. The Department requires us to monitor these contaminants in order to identify conditions that may adversely affect the taste, odor or appearance of drinking water. Because the MCL for secondary standard contaminants is not based on health effects, the presence of these contaminants in the water does not indicate that the water poses a health risk.

Table 2 MCLs, MCLGs, and Potential Sources for Coliform Bacteria AFRL Jan – Dec 2005				
Contaminant Name	**Highest Level Detected**	**MCL**	**MCLG**	**Major Source in Drinking Water**
Coliform, Fecal	0	Presence of coliform in < 5% of monthly samples	0	Human and animal fecal waste
Coliform, Total	0	Presence of coliform in < 5% of monthly samples	0	Naturally present in environment

Table 3 Primary Drinking Water Standard Contaminants Lead and Copper (AFRL) Jan – Dec 2005							
Contaminant	**MCLG (ppb)**	**No. of samples collected**	**90th percentile Level Found**	**Range (ppb)**	**MCL (ppb)**	**No. Sites Exceeding MCL**	**Typical Source of Contaminant**
Lead (ppb)	2.00	10	6.49	ND – 6.67	15	0	Internal corrosion
Copper (ppb)	0.17	10	144	51.4-372	1300	0	Natural deposits

Lead

Lead is a natural metal used in some pipe fittings. Small amounts of lead can enter drinking water from internal corrosion of these fittings. Infants and children who drink water-containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

Copper

Copper is a metal found in natural deposits and is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water-containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal physician.

Table 4 Primary Drinking Water Standard Contaminant Inorganic Chemicals (AFRL) Jan – Dec 2005						
Chemical or Constituent (and reporting units)	**Violation?**	**Highest level detected**	**Range**	**MCL**	**PHG (MCLG)**	**Typical Source of contaminant**
Arsenic (ppb) **	**No**	45.4	4.95 – 45.4 (21.85 Avg)	50	10	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
Chromium (ppb)	**No**	9.02	ND – 9.02	50	2.5	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Fluoride (ppm) Last tested in 2003	**No**	0.32	0.32-0.32	2.0	1.0	Erosion of natural deposits; water additives; discharge from fertilizer and aluminum plants
Nitrate (as NO_3) (ppm)	**No**	5.40	ND – 5.40	45	45	Runoff and leaching from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Total Trihalomethanes* (ppb)	**No**	57.78	5.60 – 57.78	80	n/a	By-products of chlorination
HAA5* (ppb)	**No**	25.32	3.73- 25.32	60	n/a	
Gross Alpha (pCi/l)	**No**	6.36	2.57 – 6.36	15	0	Radioactive mineral deposits.

* (Annual Average)

<u>Arsenic**</u>

The "highest level detected" represents the concentration of arsenic directly from one well. This water is blended with AVEK water prior to distribution that reduces the final concentration. The MCL applies to the annual average. The EPA established a new standard of 10 ppb for arsenic in 2001. All public water systems are required to comply with this standard by January 2006. EAFB is

currently blending the well water with AVEK water to ensure compliance. This Method is referred to as arsenic blending and was approved by Department of Health Services (DHS) in January 2006.

Arsenic is a naturally-occurring mineral known to cause cancer in humans at high concentrations. Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

Nitrate

Nitrate in drinking water at levels above 45 ppm is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of skin. Nitrate levels above 45 ppm may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask for advice from your health care provider.

Total Trihalomethanes

Trihalomethanes are a by-product of chlorination in drinking water. Some people who drink water containing Trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidney, or central nervous system, and may have an increased risk of getting cancer. Total Trihalomethane sampling results are based on an annual running average. The current average does not constitute a violation, and does comply with the MCL.

Gross Alpha

Initial Gross Alpha contamination is required to be sampled for 4 consecutive quarters, every 4 years by the Environmental Protection Agency and the Department of Health Services. Gross Alpha sampling results received in 2001 indicated the wells used at EAFB will be required to be sampled every 3, 6, or 9 years. EAFB is proactively sampling all wells for Gross Alpha every 3 years. The numbers reported are from samples taken in 2005. The next batch of samples will be taken in 2008.

Table 5
Secondary Drinking Water Standard Contaminant
AFRL
Jan – Dec 2005

Chemical or Constituent (and reporting units)	**Violation?**	**Avg**	**MCL**	**PHG**
Hardness (ppm)	**No**	102.9	none	N/A
Alkalinity (ppm)	**No**	105.6	none	N/A
Specific Conductance ($\mu\Omega^{-1}\cdot cm^{-1}$)	**No**	579.8	1600	N/A
Total Dissolved Solids (TDS) (ppm)	**No**	394.7	1000	500
Color (units)	**Yes**	20.7	15	N/A
Turbidity (National Turbidity Units)	**No**	3.3	5 Units	N/A

Color
Color is a secondary standard which measures the aesthetic aspect of water. The relative high value of color is due to high contents of iron in the water. Water color does not have any negative health implication.

Turbidity
Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of water quality. High turbidity can hinder the effectiveness of disinfectants. Areas affected by high turbidity have been placed on a regular flushing schedule to reduce turbidity.

Public Involvement

Questions regarding the content of this report may be directed to: 95th Aerospace Medicine Squadron/Bioenvironmental Engineering Flight (661-277-3272). Additional questions may be directed to Environmental Management Public Affairs, (661-277-1454).

The following periodic meetings are also open to the public:

- Base Town Hall meetings are held on an as needed basis
- Base Commanders Call meetings are held periodically

Times and locations for these meetings will be posted and televised on channel 6, announced in *"Desert Wings",* and can also be accessed on the base website.